

PATENT SPECIFICATION

903,885

DRAWINGS ATTACHED.



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COMPLETE SPECIFICATION.

Latching Devices.

We, CAMLOC FASTENER CORPORATION, a Corporation organised and existing under the laws of the State of New York, United States of America, of 22 Spring Valley Road, Paramus, New Jersey, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to latching devices and relates more particularly to a combination of latch and keeper therefor which secures two members which are movable relative to each other in locked relation and also serves as a carrying handle for one of the members if it is to be bodily transported.

An important object of the invention is to provide a latch for a slidable drawer-like member forming a housing for an electronic chassis which is conveniently made completely removable from a frame or cabinet for purposes of inspection or repair. In installations of this character the chassis will be electrically connected with an electronic unit by means of complementary male and female connectors, one of which is positioned at the rear of the drawer and the other at the rear of the recess receiving the drawer and the two components become connected when the drawer is moved fully into the supporting frame. Since these connectors have a number of individual frictional elements considerable force is required to engage or disengage the connectors.

It is an object of the present invention to provide a latch with a hinged handle having two camming elements, one for moving the drawer outwardly a sufficient distance to disengage the connectors and the other for fully re-engaging them. These camming ele-

ments provide a multiplication of force which renders this initial travel in either direction easy to accomplish.

Another object of the invention is to provide a novel latch and keeper therefor which are mounted on the front faces of the drawer and frame, respectively, and wherein no parts of the device extend to the rear of said faces so the entire inner area of the chassis is made available for the components to be installed therein. Drawers and frames of this character almost invariably have equally spaced, pre-drilled holes which receive ordinary machine screws heretofore used for securing the drawers or other slidable members in the supporting frame. A separate handle was installed for pulling the drawer out of the frame and for carrying the drawer. The latch and keeper of the present invention utilize these holes in their present location and enable the latch device to be quickly installed and this installation can be effected without any destruction or modification of the frame and drawers beyond forming a square opening at or adjacent the edge of the front wall of the drawers through which the keeper, secured to the frame, projects forwardly. In the event that the keeper is round, a round hole may be drilled. Another important advantage of the latch and keeper is in the extreme flexibility of location of installation. In most instances a latch is secured with the handle in a vertical position along each vertical edge of said front wall with the keeper below the handle. This leaves substantially the entire face of the front available for the installation of control members. In other instance the handle may be in a horizontal position with the keeper located at the side. In other words, the latch assembly can be mounted in any position and location so long as there is a frame member.

behind the camming portion of the handle on which the keeper can be mounted.

A still further object of the invention is to provide a combination of cam latch and keeper therefor wherein the drawer, in addition to being prevented from moving outwardly of the frame, is also prevented from up, down, or appreciable sidewise movement in either direction. Considering the handle being mounted in a vertical position, this novel locking relationship is achieved first, by a novel C-shaped cam on the handle, which, when the parts are in engaged position prevents upward movement of the drawer, second by a close positioning between the handle mounting bracket and the keeper, preventing downward travel of the drawer and finally, by forming the cam, which enters a slot in the keeper almost as wide as the slot, thus preventing all but slight sidewise travel. Thus the security of the drawer against unwanted movement does not require a close fit between the drawer and the frame opening to receive the drawer.

According to the present invention a latching device for use in combination with a frame having an opening and a member supported in slidable relation within said opening, comprises a latch and keeper therefor whereby said member may be secured within the frame, said latch comprising a bracket and a latch handle pivotally mounted, about an axis adjacent one of its ends, at one end of said bracket, said handle having an extension forming a lever beyond the pivot, said keeper having an opening therein to receive the lever, said bracket and keeper being provided with substantially flat rear faces which engage the front faces of the slidable member and frame, respectively, and to which they are secured in aligned, juxtaposed relation, said lever having a front camming surface which engages a front wall of the keeper opening when the handle is rotated in one direction to urge the member into the frame and a rear camming surface which reacts against a rear wall of the keeper opening when the handle is rotated in the opposite direction to urge the member out of the frame.

The invention will now be described further, by way of example only, with reference to the accompanying drawings in which:—

Fig. 1 is a broken perspective view of a latch of the present invention in a typical installation;

Fig. 2 is a side elevation of the latch and a keeper, partially in section;

Fig. 3 is a broken front elevation showing a modified keeper and installation arrangement; and

Fig. 4 is a perspective view showing a horizontal installation of the latch.

A latch handle 20 is shown in Figs. 1 and 2 as being mounted in a vertical position on a horizontal pivot and in these views 10 indicates a fixed frame which may comprise the front wall of a cabinet having an opening 11 to receive a drawer 12 having a front panel 13, the drawer being slidable outwardly of the cabinet.

A latch of the present invention comprises a vertical base plate or bracket 14 having a bifurcated forward extension at its lower end forming spaced ears 15 through which a pivot pin 16 passes for mounting the latch handle 20. At its upper end the bracket has a thickened portion 21 and the bracket is secured to the front face of the drawer by means of screws 22.

A generally oval shaped horizontal opening 23 is formed at the upper end of the bracket and a steel pin 24 passes through the upper section of this opening. The latch handle 20 has an inverted L-shaped sliding lock comprising a tubular vertical portion 25 carried telescopically at the upper end of the latch handle and a rearwardly extending horizontal portion 26 having a recess 30 to form a hook and a tapered nose 31. The upper end of the latch handle has an elongated slot 32 and a pin 33 carried by tubular portion 25 limits vertical movement of the lock. A spring 34 urges the lock upwardly.

At its lower end below pivot pin 16 the latch handle 20 has an arcuate extension 29 forming a cam having a forwardly facing, substantially C-shaped camming surface 35 which engages a sleeve 36 carried on a pin 40 passing between two ears 41 of a bifurcated or fork-shaped keeper 42 secured by a screw 43 to frame 10. Shims of varying thickness, one of which is shown at 39, may be positioned between the keeper and the frame to properly locate the keeper so as to secure a tight lock. The only modification in the drawer, which is of conventional construction, is to form a suitable opening 46 in the lower corner of the front panel 13 thereof to receive the keeper as the drawer is moved to closed position. If desired sleeve 36 may be omitted and the camming surface will directly engage the pin 40. A recess formed by the spaced ears of the keeper is defined at its rear by an interconnecting wall 44 which is engaged during initial outward travel of the drawer by a convex rear surface 45 of extension 29. Thus the spaced ears form, with the pin 40, a vertical opening to receive the extension 29. The width of the recess is only slightly more than the width of the cam so as to prevent appreciable lateral movement of the cam and hence the drawer.

Fig. 2 shows the parts in locked position and the hook 30 of the lock portion 26 has received fixed pin 24 in opening 23. Cam

surface 35 engages the under side of sleeve 36 in the keeper and it will also be noted that a portion of an arcuate rear face of the handle engages the upper corner of the keeper, thus preventing both downward and upward movement of the drawer. When it is desired to disengage the latch, lock 25—26 is depressed, which frees hook 30 from engagement with pin 24. Forward movement of the upper end of the latch handle causes convex cam surface 45 to move against wall 44 of the keeper, thereby exerting a lever action to move the drawer outwardly. As soon as the curved extension 29 clears sleeve 36 on outward travel of the sliding drawer the latch handle is moved rearwardly to the locked position wherein it serves as a carrying handle if the drawer is removed and transported. The lever also may function as a supporting leg for the drawer in the event that it becomes necessary to work on contacts at the inner end of the drawer. This arrangement protects any dials or knobs on the front wall of the drawer.

To replace the drawer and engage the latch the upper lock is disengaged and drawn forwardly to permit extension 29 to clear the sleeve 36, after which the handle is moved rearwardly, thus causing cam surface 35 to move the drawer fully home, after which the upper lock is engaged.

When the latch of the present invention is used on a drawer forming a housing for an electronic chassis, and separable connectors having a considerable number of male and female contacts are employed, the initial resistance to movement of the drawer is at its maximum and cam 29 is illustrated as being formed to give the greatest multiplication of force at this time. As the male contacts are being withdrawn from the female contacts the resistance to travel progressively decreases and accordingly the multiplication of force decreases as wall 44 is progressively engaged by cam surface 45 towards its high point, i.e., at its lower end. The invention is not, of course, limited to any particular shape of cam surface or degree of multiplication of force.

In a typical installation one of the latches is positioned on each side of the drawer so as to balance the pulling or pushing forces necessary to withdraw the drawer or to return it to closed position. This arrangement also permits substantially the entire front face of the drawer to be free for the installation of control elements if the latch is used on an electronics installation. In other applications a single latch may be used which will preferably be centred relative to the drawer.

Arrangements for mounting such a single latch both vertically and horizontally are illustrated in Figs. 3 and 4 respectively. In Fig. 3 the keeper 50 mounted on frame 51

is shown as being round instead of square as shown in Fig. 1 and a pin 52 without the sleeve is employed. The front panel 53 of the drawer supports bracket 54 and the handle 55 is pivotally mounted thereon at 56. Instead of the square cut-out of Fig. 1 a circular opening 60 is formed in the panel to receive the keeper.

In Fig. 4 the bracket 62 is mounted horizontally on panel 63 forming the front of the drawer. A square keeper 64 is mounted on the front of the supporting framework 65 and the panel has an opening 66 to receive the keeper. The handle 70 is pivoted at 71 in a horizontal position and the cam 72 extends laterally into the recess 73 of the keeper.

This view illustrates the flexibility of application of the latch where the front panel has a height less than the length of bracket 62 so the vertical mounting would not be possible.

The latch device of the present invention is shown in the drawings in two of the positions that it customarily occupies when assembled. It may also be applied to the upper or to the lower faces of a frame and a vertically movable drawer-like member. Because of its extreme flexibility of application the two installation positions are shown by way of example only, although it has been found that the preferred method of application is that shown in Fig. 1 and it is for that reason, and also for the sake of clarity, that some of the claims define the structure in the position it occupies in Fig. 1 with the keeper and the elongated bracket in superimposed relation. This definition of the structure is not, however, to be taken in any limiting sense.

While there have been described herein what are at present considered preferred embodiments of the invention, it will be obvious to those skilled in the art that many modifications and changes may be made therein without departing from the invention. It is therefore to be understood that the exemplary embodiments are illustrative and not restrictive of the invention, the scope of which is defined in the appended claims, and that all modifications that come within the meaning and range of the claims are intended to be included therein.

WHAT WE CLAIM IS:—

1. A latching device for use in combination with a frame having an opening and a member supported in slidable relation within said opening, comprising a latch and keeper therefore whereby said member may be secured within the frame, said latch comprising a bracket and a latch handle pivotally mounted, about an axis adjacent one of its ends, at one end of said bracket, said handle having an extension forming a lever

- beyond the pivot, said keeper having an opening therein to receive the lever, said bracket and keeper being provided with substantially flat rear faces which engage the front faces of the slidable member and frame, respectively, and to which they are secured in aligned, juxtaposed relation, said lever having a front camming surface which engages a front wall of the keeper opening when the handle is rotated in one direction to urge the member into the frame and a rear camming surface which reacts against a rear wall of the keeper opening when the handle is rotated in the opposite direction to urge the member out of the frame.
2. A latching device as claimed in Claim 1 in which said bracket is adapted to receive and releasably retain the remote end of the handle.
3. A latching device as claimed in Claim 1 or 2 in which said member has an opening therethrough to receive the keeper.
4. A latching device as claimed in any one of the preceding claims in which the front wall of the keeper opening is defined by a pin.
5. A latching device as claimed in any one of the preceding claims in which the cross-sectional dimensions of the lever and the corresponding dimensions of the keeper opening are such as to prevent appreciable sideways movement of the member within the frame when the latch is in a locked position.
6. A latching device as claimed in any one of the preceding claims in which the relative positioning of the keeper and bracket is such as to limit movement of the member towards the keeper.
7. A frame having an opening and a drawer-like member supported in slidable relation within the opening and provided with a front panel, having a latching device as claimed in any one of the preceding claims.
8. A latching device substantially as hereinbefore described with reference to and as illustrated in Figs. 1 and 2; Fig. 3; or Fig. 4 of the accompanying drawings.

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FIG. 1

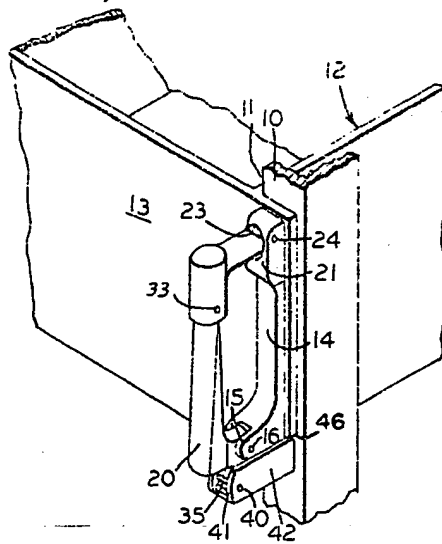


FIG. 2

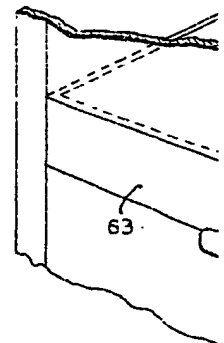
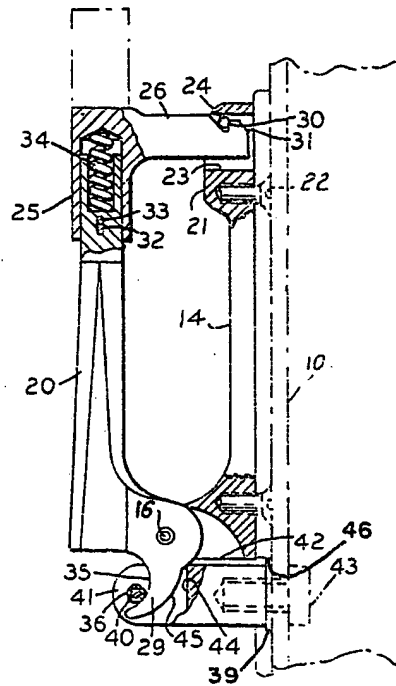


FIG. 3

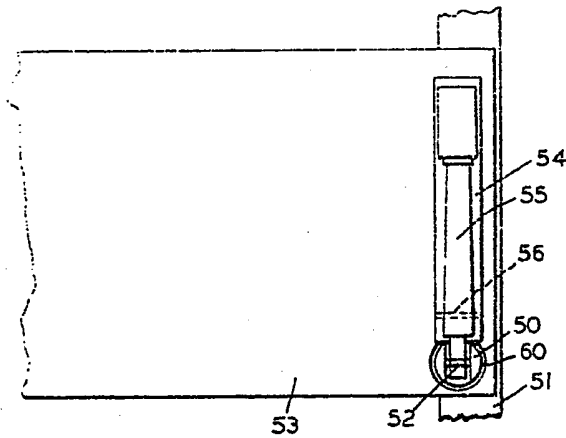


FIG. 4

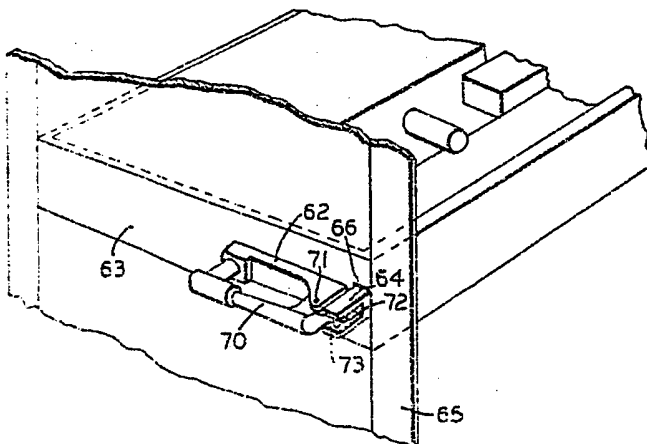


FIG. 1

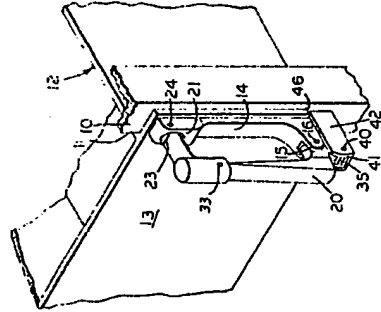


FIG. 2

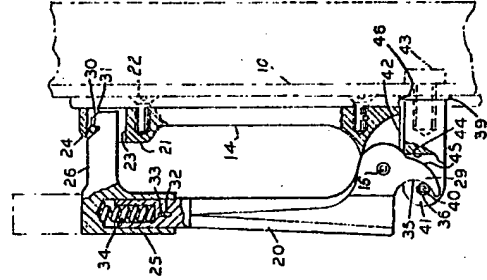


FIG. 3

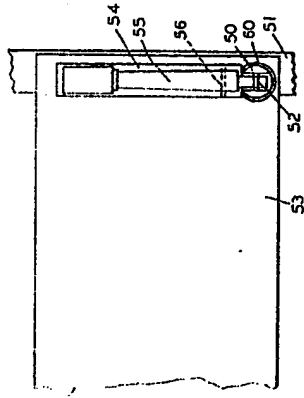
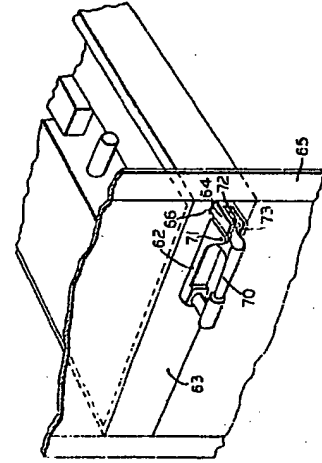


FIG. 4



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